POTENTIAL FOR SMALL RUMINANTS UNDER COCONUT

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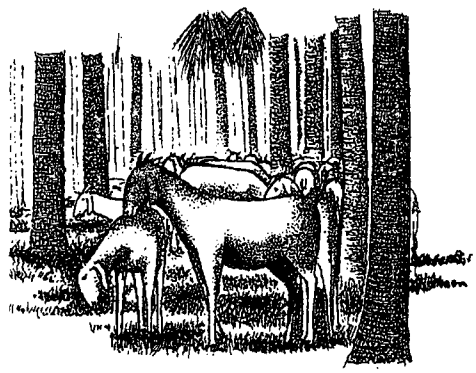
Livestock keeping in coconut lands not only gives an additional income for the coconut growers but also reduces the cost of production by providing manure and free weeding in coconut lands. Sixty five to seventy percent of the cost of production of coconut is used for weeding and manuring. It has been found that farm animals can reduce the cost of weeding by 60% and application of animal manure can reduce the cost of manuring by 40%. Cattle and Buffalo keeping under coconut have been the traditional systems, but due to the high cost of production, lack of free grazing area



and shortage of feeds in dry periods, traditional farmers tend to move out of the industry. These conditions are prominent in large coconut holdings. In addition to these reasons, finding labour for livestock keeping has been a major issue in large holders. Nevertheless, value of farm animals in coconut lands for secondary benefits (benefits other than milk or meat) is well understood.

One of the major limitations for development of livestock is the poor quality of available natural grasses under coconut and scarcity of feeds during dry periods. In this respect small ruminants such as Goats and Sheep are ideal for both small and large coconut holdings. Advantages of rearing small ruminants for small holders are less risk, easy to handle, and insurance when crop fails. For large coconut holders, small ruminants are preferred to large ruminants, as they require less management attention and low labour.

Goat and Sheep are mainly kept for meat in Sri Lanka in addition to milk and manure. There is a ready market for meat, but market for goat milk is not well established, although the price of goat milk in urban areas is 6-10 times higher than cow milk. The farmers show low emphasis for milk production due to lack of organized marketing facilities Goat milk is especially recommended for babies and those who have digestive problems because of higher proportion of small fat globules in goat's milk.

Goats and Sheep have number of biological and behavioral characteristics that makes them preferable to large ruminants in coconut lands. Goats are especially preferred due to their adaptability to wide range of feed sources and for not

losing weight in adverse conditions as other ruminants. Goats can remain for several days without drinking water and have relatively high degree of resistance to number of parasitic diseases. Grazing behavior goat is remarkably different from other farm animals and hence some researchers term them as "mixed farming opportunists" to avoid the confusion of classifying them either as browsers or grazers. One of the unique characteristics of goats is their ability to digest coarse feeds, various browse are plants and weeds that are otherwise would not be used. Compared to sheep and cattle, goats have greater tolerance to greater bitterness. Thus they consume shrubs and tree leaves, which are normally rejected by other animals. Therefore, goats can survive and flourish in much wider conditions than other ruminants. In addition, goats produce more meat and milk per unit of feeds than other ruminants. However, in case of weeding in coconut lands, goats are not the best weeders comparing to sheep and cattle because of their feeding habit. The other disadvantage of goats, like cattle and buffaloes are that they damage coconut seedlings, but proper management could mitigate this.

Sheep are considered as good weeders in coconut lands due to their unique grazing behavior when compared to cattle and goats. They graze at very closer to the ground level than cattle and also on grasses around dung and urine patches, which cattle often avoid. This results in uniform weeding in coconut lands. Another unique feature of sheep is that they do not damage coconut seedlings. Sheep breeds such as Bikanary and Red Madras are recommended for lands in the coconut triangle. However, unavailability of enough breeding stocks is a major constraint for rearing sheep under coconut.

Goats and sheep have higher reproductive rates than cattle. Two kidding can be expected every year if conditions are favorable. According to the studies carried out in coconut growing areas, rate of kidding was reported as three kidding in two years in the same study triplet births have also occurred apart from the common twins. However, keeping small ruminant for meat purpose is not popular in most of the coconut growing areas where majority of the population is Buddhists.

Management systems

Goat management systems under coconut can be categorized as tethering or extensive grazing and intensive stall- feeding. In case of extensive grazing under coconut, natural herbage is the major source of feed. Annual dry matter production of natural grasses under coconut is 900-1000 kg per ha with crude protein content approx. 8%. Assuming that daily dry matter intake is 3% of the body weight (25kg) the equivalent carrying capacity is 3-4 animals per ha. But in case of goats, extensive grazing with improved pasture (*Setaria sphacelata*) with supplementation of *Gliricidia*; the carrying capacity could

be increased to 15 -20 animals per ha. It has been reported that 15- 20 heads of sheep per hectare can be kept with *B. milliformis* under coconut. With improved pasture, sheep can graze together with cattle as sheep graze on cattle grazed grasslands. Mixed pasturing with sheep and cattle not only increase dry matter production of grasses, but also help in reducing weed growth and worm infections of farm animals.

For intensive stall-feeding cultivated grasses, tree fodder or their by products can be used. Guinea grass (*Panicum maximum*) is the preferred fodder grass but caution must be taken to fertilize cultivated grasses as they compete for nutrients in the soil with coconut. Guinea grasses if not properly managed can become a weed in the coconut lands. An adequate intake of dry matter can also be ensured by adding tree leaves in the diet. *Gliricidia*, a promising tree fodder in coconut lands can be used as a feed supplement for goats. *Gliricidia* could be planted as a fodder bank in a separate area in the land or could be planted along the fence. On an average 5-6 kg of leaf matter/ plant (on fresh basis) could be obtained annually. Apart from that Erithrina, Ipil-ipl, Bahunia, Thespesia, Artucapus etc. are examples of widely used tree fodder for feeding goats.

Goat and sheep manure as a source of organic fertilizer in coconut lands

Organic fertilizer, while providing nutrients has a secondary role by way of enhancing microbiological activity, improvement of water holding capacity, cation exchange capacity (CEC) and other physical properties of the soil. This is more beneficial in lateritic and sandy soils. Goat manure contains relatively higher content of nutrients than other organic manure. Researches have shown that Goat manure supplemented with inorganic fertilizers increased coconut yield (nuts/palm/year) by 35 % than palms treated solely with inorganic fertilizer.

Coconut Research Institute recommends 25 kg of goat dung (for sandy and lateritic soils) supplemented with 800 g of Muriate of Potash, for a palm per annum. Dung production of a mature animal is approximately 700-800g per day on fresh basis resulting 250- 300 kg per annum. Therefore, 13-16 heads of goats can provide the entire manure requirement for 1 ha. land of coconut.

Goat and sheep being small ruminants better adapted to wide range of conditions with multifarious uses, are ideal for coconut lands especially in the intermediate and dry zones. Due to less attention needed and ability to withstand fluctuating feed availability, they are superior to other farm animals such as cattle and buffaloes. Therefore the possibilities of reducing cost of production of the coconut while ensuring a better land utilization and increased productivity, especially in large coconut holdings, through integrated animal production are substantial.